

Nos. 22-1325, -1327

In the
United States Court of Appeals
for the Federal Circuit

APPLE INC.,
Appellant,

v.

COREPHOTONICS, LTD.,
Cross-Appellant.

On Appeal from the Patent Trial and Appeal Board in
Inter Partes Review Nos. IPR2022-00878

CROSS-APPELLANT COREPHOTONICS, LTD.'S REPLY BRIEF

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Dated: January 6, 2023

RELEVANT CLAIM LANGUAGE AT ISSUE

Appeal number 22-1325 concerns claims 3, 8, 19, 24, 16 and 30 of U.S. Patent No. 10,330,897 (“897 patent”). Appeal number 22-1327 concerns claims 2, 5, 6, 18, and 21-23. The claims relevant to the 1327 appeal, and the claims they depend from recite as follows:

1. A lens assembly, comprising: a plurality of lens elements arranged along an optical axis and spaced apart by respective spaces, wherein the lens assembly has an effective focal length (EFL), a total track length (TTL) of 6.5 millimeters or less and a ratio $TTL/EFL < 1.0$, wherein the plurality of lens elements includes, in order from an object side to an image side, a first group comprising lens elements L_{1_1} , L_{1_2} and L_{1_3} with respective focal lengths f_{1_1} , f_{1_2} and f_{1_3} and a second group comprising lens elements L_{2_1} and L_{2_2} , wherein the first and second groups of lens elements are separated by a gap that is larger than twice any other gap between lens elements, wherein lens element L_{1_1} has positive refractive power and lens element L_{1_2} has negative refractive power and wherein lens elements L_{2_1} and L_{2_2} have opposite refractive powers.

2. The lens assembly of claim 1, wherein the TTL is equal or smaller than 6.0 mm and wherein the lens assembly has a f-number $F\# < 2.9$.

5. The lens assembly of claim 1, wherein the lens assembly has a f-number $F\# < 2.9$.

6. The lens assembly of claim 5, wherein lens element L_{1_1} has a concave image-side surface.

17. A lens assembly, comprising a plurality of lens elements arranged along an optical axis and spaced apart by respective spaces, wherein the lens assembly has an effective focal length (EFL), wherein a lens system that includes the lens assembly plus a window positioned between the plurality of

lens elements and an image plane has a total track length (TTL) of 6.5 millimeters or less, wherein a ratio $TTL/EFL < 1.0$, wherein the plurality of lens elements includes, in order from an object side to an image side, a first group comprising lens elements L_{1_1} , L_{1_2} and L_{1_3} with respective focal lengths f_{1_2} and f_{1_3} , and a second group comprising lens elements L_{2_1} and L_{2_2} , wherein lens element L_{1_1} has positive refractive power and lens element L_{1_2} has negative refractive power, wherein $1.2 \times |f_{1_3}| > |f_{1_2}| > 1.5 \times f_{1_1}$ and wherein lens elements L_{2_1} and L_{2_2} have opposite refractive powers.

18. The lens assembly of claim 17, wherein the TTL is equal or smaller than 6.0 mm and wherein the lens assembly has a f-number $F\# < 2.9$.

21. The lens assembly of claim 17, wherein the lens assembly has a f-number $F\# < 2.9$.

22. The lens assembly of claim 21, wherein lens element L_{1_1} has a concave image-side surface.

23. The lens assembly of claim 17, wherein the lens assembly has an f-number $F\# = 2.8$.

FORM 9. Certificate of Interest

Form 9 (p. 1)
July 2020

**UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

CERTIFICATE OF INTEREST

Case Number 2022-1325, 2022-1327

Short Case Caption Apple Inc. v. Corephotonics, Ltd.

Filing Party/Entity Cross-Appellant Corephotonics, Ltd.

Instructions: Complete each section of the form. In answering items 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance. **Please enter only one item per box; attach additional pages as needed and check the relevant box.** Counsel must immediately file an amended Certificate of Interest if information changes. Fed. Cir. R. 47.4(b).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: 1/6/23

Signature: /s/ Brian D. Ledahl

Name: Brian D. Ledahl

FORM 9. Certificate of Interest

Form 9 (p. 2)
July 2020

1. Represented Entities. Fed. Cir. R. 47.4(a)(1).	2. Real Party in Interest. Fed. Cir. R. 47.4(a)(2).	3. Parent Corporations and Stockholders. Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities. <input checked="" type="checkbox"/> None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities. <input type="checkbox"/> None/Not Applicable
Corephotonics, Ltd.		Samsung Electronics Benelux B.V.

☐ Additional pages attached

FORM 9. Certificate of Interest

Form 9 (p. 3)
July 2020

4. Legal Representatives. List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

☐ None/Not Applicable

☐ Additional pages attached

C. Jay Chung (formerly of Russ August & Kabat)	Jonathan Link (of Russ August & Kabat)	

5. Related Cases. Provide the case titles and numbers of any case known to be pending in this court or any other court or agency that will directly affect or be directly affected by this court's decision in the pending appeal. Do not include the originating case number(s) for this case. Fed. Cir. R. 47.4(a)(5). See also Fed. Cir. R. 47.5(b).

☐ None/Not Applicable

☐ Additional pages attached

Corephotronics, Ltd. v. Apple Inc., Case No. 5:19-cv-04809 (N.D. Cal.)		

6. Organizational Victims and Bankruptcy Cases. Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☒ None/Not Applicable

☐ Additional pages attached

TABLE OF CONTENTS

RELEVANT CLAIM LANGUAGE AT ISSUE.....	i
CERTIFICATE OF INTEREST	iii
TABLE OF CONTENTS.....	vi
TABLE OF AUTHORITIES	vii
INTRODUCTION	1
ARGUMENT	3
I. The Board Erred In Failing To Address The Lack Of Any Evidence Of Reasonable Expectation Of Success	3
II. The Board Abused its Discretion by Allowing Apple’s Entirely New Proposed Combination Presented In Reply	8
A. Apple Was Not Entitled To Present A New Theory Of Obviousness In Reply.....	8
B. Apple’s New Combination Was Not Evidence Supporting The Theory In The Petition	10
CONCLUSION.....	13
CERTIFICATE OF COMPLIANCE	15

TABLE OF AUTHORITIES

Cases

<i>Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	9
<i>Wasica Fin. GmbH v. Contl. Automotive Sys., Inc.</i> , 853 F.3d 1272 (Fed. Cir. 2017)	9

INTRODUCTION

Corephotonics identified two critical errors in the PTAB's determination that various claims challenged in Ground 2 of Apple's petition were unpatentable. Apple fails to show that the Board's determinations were either legally or factually supported.

First, the Board erred in finding that a person skilled in the art would somehow be motivated to make a hypothetical lens design that could not, in fact, be manufactured by such a person. Apple mischaracterizes this issue as addressed to commercial manufacturability. In reality, Apple failed to present evidence that a person of ordinary skill in the art could manufacture the lenses it hypothesized, for any purpose. The undisputed evidence showed that Apple's hypothetical lens would require an unachievable lens with an edge less than half the thickness of a human hair. No person of skill in the art would set out to make such a lens and the Board erred in failing to properly address the argument Corephotonics actually made and in failing to recognize Apple's complete lack of evidence to support its petition in this regard.

Second, the Board abused its discretion by permitting an entirely new theory of invalidity first presented in reply. In its petition, Apple

proposed a combination of the asserted prior art in the form of a hypothetical lens that it claimed would have been obvious to a person skilled in the art. Corephotonics showed in its Patent Owner Response that a person of ordinary skill in the art could not make such a lens assembly in the real world and that no person of skill in the art would ever pursue such a ridiculous lens design. While Apple may have had the right to present evidence in reply that a person skilled in the art would have been able to make its unmakeable lens assembly, Apple failed to present any such evidence. Instead, on reply, Apple presented entirely new evidence of an entirely different hypothetical lens design as its new purported combination of the prior art. This entirely new purported combination of the prior art in reply far exceeded the proper bounds of an IPR proceeding, and the Board erred in considering the argument at all. To the extent that Apple argues that the new design somehow showed that the original modification could have been manufactured, that argument is nonsensical and could not support Apple's petition. Each of these errors requires reversal, or at a minimum vacatur and remand of the Board's findings of unpatentability.

ARGUMENT

I. The Board Erred In Failing To Address The Lack Of Any Evidence Of Reasonable Expectation Of Success

As discussed in the Red Brief, Ground 2 of Apple's IPR petition required making numerous proposed modifications to an exemplary lens design in the Ogino reference. Apple suggested that a person of ordinary skill in the art would be motivated to make these numerous modifications to drastically change the F# of the Ogino example from 3.94 to 2.8. Appx4414; Appx4493-4494; Appx1193. To make this significant change, Apple hypothesized that a person skilled in the art would modify the first lens element of Ogino's example 5 to widen the lens aperture. Appx24.

Apple's petition relied on this particular hypothetical modified version of Ogino's Example 5 as the basis for its contention of obviousness in Ground 2 of its petition. In its Patent Owner Response, Corephotonics showed that this hypothetical modified version of Ogino's Example 5 was unworkable because it required unrealistic dimensions that could not be manufactured. Appx4418-4439; Appx4498-4517. Specifically, Corephotonics showed that the hypothetical modified version of the Ogino example posited by Apple would require creating a lens element with an edge

approximately half the thickness of a human hair. Appx4503-4504. Corephotonics showed that such a lens element could not be manufactured because of the incredibly tiny edges required by Apple's proposed modifications. *See, e.g.*, Appx4505-4508; Appx5464-5468. Further, Corephotonics showed that even if the lens element could be manufactured, it could not be mounted into a lens assembly because the edge thickness would not allow for it to be mounted without breaking. Appx4513. Thus, Corephotonics showed that Apple's supposedly obvious hypothetical could not exist as a real lens assembly because it could not actually be made by a person or ordinary skill. This makes Apple's proposed modification of the Ogino example unworkable as a basis for an obviousness claim. If it could not be made as proposed, then Apple failed to show that a person skilled in the art would be motivated to create this hypothetical combination, and certainly failed to show that they would have any reasonable expectation of success. Corephotonics showed numerous reasons why a person skilled in the art would recognize the practical impossibility of Apple's supposed combination.

Apple, like the Board, improperly tries to elide this problem by arguing that “manufacturability concerns” were not limitations of the challenged claims. This argument is a red herring. If the proposed modification relied on by Apple could not be made, that is not a “manufacturing concern,” it is a failure to show obviousness because it relies on a combination that a person skilled in the art could not and would not make. The challenged claims recite a “lens assembly.” They do not claim a hypothetical construct of elements that bend light, but rather a thing – a lens assembly – that can exist and be created in the universe of reality. The fact that Apple’s proposed combination of references leads to something that could not be created and would not exist in the universe of reality makes it unavailing as a basis for asserting obviousness. Apple might as well have proposed that a person skilled in the art make the lens assembly using the fictional metal, vibranium, used to make Captain America’s shield in popular Marvel movies. No person of skill in the art could make a lens assembly with vibranium, just as no person of skill in the art could make a lens assembly with Apple’s ridiculous hypothetical razor-sharp lens element. The claims need not recite that the claimed invention exists in the real world for that to be a requirement.

Apple failed to show that its proposed lens assembly containing its hypothetical lens element could be made in the real world by a person of ordinary skill in the art. Apple coyly suggests in the Yellow Brief that a person skilled in the art could be motivated to make lenses for non-commercial uses such as experimental or research purposes. Yellow Brief at 21-22. But Apple's argument is misleading at best. First, Corephotonics did not merely present evidence that Apple's proposed hypothetical lens assembly would not be manufacturable at commercial scale. Corephotonics presented evidence that Apple's proposed assembly could not be manufactured at all, for any purpose. Notably, Corephotonics expert explained in unrebutted testimony that "a POSITA would immediately recognize that this lens would need to be oversized. **There's no way it could be manufactured the way it is.**" Appx5467-5468 (emphasis added); *see also* Appx5547-5548 (testifying that designs with such narrow edge thicknesses could not be manufactured). Apple presented no evidence in reply that rebutted this showing and it points to none in the Yellow Brief. Apple points to two paragraphs in the reply declaration of its expert. Yellow Brief at 22, citing Appx6108-6109. But those paragraphs do not actually ever say that the proposed lens assembly could be

manufactured by a person skilled in the art, or how. Rather, they merely try to recast Corephotonics' evidence (falsely) to suggest that Corephotonics merely argued that Apple's hypothetical lens could not easily be mass-produced. Corephotonics' evidence did not merely show the inability to mass-produce the hypothetical lens, but to produce it at all. Apple relies on a mischaracterization of the evidence. It failed to present any actual evidence showing that anyone could make its hypothetical lens assembly, much less a person with a bachelor's degree and approximately three years of experience. *See Appx11.*

Apple's failure of proof that a person skilled in the art could actually even make the hypothetical lens assembly it relied on to argue obviousness is fatal to Ground 2 of its petition and the Board's findings on that ground should accordingly be reversed. At a minimum, the record is clear that the Board failed to actually consider the evidence and argument presented by Corephotonics. Instead, the Board made the legal error of suggesting that because the asserted claims did not recite any elements relating to manufacturability, Apple was not required to present evidence that a person skilled in the art could have actually made the proposed combination. That was a clear legal error. Claims to an apparatus recite

real objects. To render those claims obvious, a challenger must show that the supposed combination of prior art relied upon could also be made into a real object. The Board erroneously chose to ignore this obligation. This error would, at a minimum require vacatur and remand to allow for proper consideration of Apple's evidentiary failure by the Board in the first instance.

II. The Board Abused its Discretion by Allowing Apple's Entirely New Proposed Combination Presented In Reply

Apple failed to present any evidence that its proposed modification of Ogino's example 5 could actually be made into a real lens assembly. In reply, rather than present evidence showing that its proposed modification could actually be made by a person skilled in the art, Apple presented an entirely different modification that made numerous changes to the combination proposed in its petition. The Board erred in accepting this improper reply submission.

A. Apple Was Not Entitled To Present A New Theory Of Obviousness In Reply

First, to the extent that Apple argued that this new modification of Ogino rendered the challenged claims obvious, that argument was unquestionably untimely. While a petitioner may submit new evidence in

reply showing why the theory advanced in the petition was correct, it may not present a new theory in reply. *Wasica Fin. GmbH v. Contl. Automotive Sys., Inc.*, 853 F.3d 1272, 1286 (Fed. Cir. 2017) (“Rather than explaining how its original petition was correct, Continental’s subsequent arguments amount to an entirely new theory of prima facie obviousness absent from the petition. Shifting arguments in this fashion is foreclosed by statute, our precedent, and Board guidelines.”); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”).

Apple argues that its new reply theory was merely responsive to arguments presented by Corephotonics in the Patent Owner Response, and thus any new evidence or argument was permissible. Apple’s argument proves too much. It essentially argues that whenever a patent owner points out a fatal flaw in a petition, that the petitioner may respond by changing its theory because that is somehow “responsive” to arguments raised by the patent owner. This Court’s *Wasica* decision precludes such

a license to sandbag. The theory in the petition is the theory that Apple must rely upon, not a new theory created in reply to try to remedy the failings of the theory in the petition. Under Apple's approach, entirely new theories of invalidity are permissible in reply as long as the patent owner has pointed to some failure of the original theory in the patent owner response. The Board lacks the authority to simply ignore the limits that the petition places on an IPR proceeding. The Board cannot expand the scope of the trial beyond the theories advanced in the petition. Apple's new theory should have been excluded on this basis and the Board's failure to do so was a clear abuse of discretion.

B. Apple's New Combination Was Not Evidence Supporting The Theory In The Petition

Apple and the Board suggest that Apple's new modification of Ogino presented in reply was not a new ground or theory of obviousness, but merely evidence supporting the initial ground. Even minimal scrutiny, however shows that this argument is entirely without merit. Apple presented a theory of invalidity in its petition based on modifying an example in the Ogino reference to create a particular different lens assembly (Modification A). Corephotonics pointed out that Modification A could

not actually be manufactured by a person of ordinary skill in the art, and thus could not render the challenged claims obvious. In reply, Apple argued that an entirely different design (Modification B), with numerous changes to the one proposed in the petition would be manufacturable. Apple and the Board suggest that this new evidence somehow supported the original theory advanced in the petition; but this makes no sense. Neither the Board in its Final Written Decision, nor Apple in the Yellow Brief explain how the manufacturability of Modification B somehow proves that Modification A could be manufactured.

To the extent that the Board found that Modification B was evidence of manufacturability of Modification A, it provided no explanation of how that could be the case. Likewise, the record contains no such evidence. Whether or not Modification B could be manufactured by a person of ordinary skill in the art cannot provide substantial (or indeed any) evidence that Modification A could be manufactured by such a person. Apple failed to provide the needed evidence and the Board made a completely illogical leap in accepting this nonsensical argument. Such an illogical leap cannot constitute substantial evidence to support the Board's decision.

Apple does not meaningfully dispute that Modification B was substantially different than Modification A. Apple suggests that Modification B could be manufactured by a person skilled in the art. Even if that was true, what Apple needed to prove was that Modification A could be manufactured by a person skilled in the art. Apple's sleight of hand substitution cannot be accepted. In the children's story of the three little pigs, one pig builds a house out of straw, but the story points out that this straw house could not withstand the huffing and puffing of the Big Bad Wolf. Of course, another pig builds a house out of brick that could withstand the Wolf's best efforts. No one would suggest that the existence of the brick house somehow proves that the straw house would survive. But that is the absurd nature of Apple's argument here. Apple presented an untenable straw house in its petition. Corephotonics showed that this straw house was untenable. In reply, Apple effectively argued that the existence of an entirely different (supposedly) brick house proved that its original straw house was reliable. That argument was nonsensical, and the Board's acceptance of it was equally nonsensical.

To the extent that the Board accepted Apple's proffered Modification B as a combination that would embody the challenged claims and that could actually be made by a person skilled in the art, it was improper for the Board to accept this new theory in reply. To the extent that the Board somehow relied on Modification B to show that Modification A could have been made by a person of ordinary skill in the art, that finding was nonsensical and unsupported by substantial evidence. In either event, the Board's finding of unpatentability should be reversed or, at a minimum vacated and remanded.

CONCLUSION

The Board's finding of unpatentability in connection with Ground 2 of Apple's petition was unsupported and should be reversed or, in the alternative, vacated and remanded. Apple failed to present evidence that its proposed modification of the asserted art could actually be made by a person of ordinary skill in the art. The Board further erred in permitting Apple to present a new proposed modification of the art in reply. If the new modification was considered as a different basis for finding invalidity, then it was an improper abuse of discretion to accept such a new

ground in reply. If it was merely considered as evidence of the manufacturability of an entirely different modification proposed in the petition, than it could provide no supporting evidence and the Board erred in relying on it.

Dated: January 6, 2023

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

The foregoing filing complies with the relevant type-volume limitation of the Federal Rules of Appellate Procedure and Federal Circuit Rules because the filing has been prepared using a proportionally-spaced typeface and includes 2,671 words.

Dated: January 6, 2022

/s/ *Brian D. Ledahl*

Brian D. Ledahl